

SEQUENCE LISTING

<110> Falco, Saverio Carl  
Hitz, William D.  
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Cahoon, Rebecca E.  
Rafalski, J. Antoni

<120> PLANT BRANCHED CHAIN AMINO ACID BIOSYNTHETIC ENZYMES

<130> BB-1126

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<150> 60/063,423  
<151> 1997 October 28

<160> 54

<170> Microsoft Word Version 7.0A

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<212> DNA  
<213> Zea mays

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Gln Gly Ala Ser Gln Ala Val Leu Tyr Gly Val Gly Leu Thr Asp Ala  
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Asp Leu Arg Lys Pro Gln Val Gly Val Ser Ser Val Trp Tyr Glu Gly  
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Gly Val Arg Glu Ala Gly Met Val Gly Phe Arg Phe Asn Thr Val Gly  
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Val Ser Asp Ala Ile Ser Met Gly Thr Arg Gly Met Cys Tyr Ser Leu  
115 120 125  
Gln Ser Arg Asp Leu Ile Ala Asp Ser Ile Glu Thr Val Met Gly Ala  
130 135 140  
Gln His Tyr Asp Ala Asn Ile Ser Ile Pro Gly Cys Asp Lys Asn Met  
145 150 155 160  
Pro Gly Thr Ile Met Ala Met Gly Arg Leu Asn Arg Pro Ser Ile Met  
165 170 175  
Ile Tyr Gly Gly Thr Ile Lys Pro Gly His Phe Gln Gly Asn Ser Tyr  
180 185 190  
Asp Ile Val Ser Ala Phe Gln Cys Tyr Gly Glu Tyr Val Ser Gly Ser  
195 200 205  
Ile Thr Asp Glu Gln Arg Lys Asn Val Leu Arg Asn Ser Cys Pro Gly  
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Ala Gly Ala Cys Gly Gly Met Tyr Thr Ala Asn Thr Met Ala Ser Ala  
225 230 235 240  
Ile Glu Thr Leu Gly Met Ser Leu Pro Tyr Ser Ser Ser Thr Pro Ala  
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260 265 270  
Leu Glu Leu Leu Lys Met Asp Leu Lys Pro Lys Asp Ile Ile Thr Glu  
275 280 285  
Lys Ser Leu Arg Asn Ala Met Val Ile Val Met Ala Leu Gly Gly Ser  
290 295 300  
Thr Asn Ala Val Leu His Leu Ile Ala Ile Ala Arg Ser Val Gly Leu  
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His Leu Thr Leu Asp Asp Phe Gln Lys Val Ser Asp Gln Val Pro Phe  
 325 330 335  
 Leu Ala Asp Leu Lys Pro Ser Gly Lys Tyr Val Met Glu Asp Leu His  
 340 345 350  
 Lys Ile Gly Gly Thr Pro Ala Val Ile His Tyr Leu Leu Glu Gln Gly  
 355 360 365  
 Leu Leu Asp Gly Asp Cys Met Thr Val Thr Gly Lys Thr Leu Ala Glu  
 370 375 380  
 Asn Ala Lys Ile Phe Pro Pro Leu Ser Glu Gly Gln Gln Ile Ile Arg  
 385 390 395 400  
 Pro Leu Asp Asn Pro Ile Lys Pro Thr Gly His Ile Gln Ile Leu Tyr  
 405 410 415  
 Gly Asn Leu Ala Pro Glu Gly Ser Val Ala Lys Ile Thr Gly Lys Glu  
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 Gly Leu Phe Phe Ser Gly Pro Ala Leu Val Phe Glu Gly Glu Glu Ser  
 435 440 445  
 Met Ile Thr Ala Ile Ser Glu Asn Pro Ala Asn Phe Lys Gly Lys Val  
 450 455 460  
 Val Val Ile Arg Gly Glu Gly Pro Lys Gly Gly Pro Gly Met Pro Glu  
 465 470 475 480  
 Met Leu Thr Pro Thr Ser Ala Ile Met Gly Ala Gly Leu Gly Lys Glu  
 485 490 495  
 Cys Ala Leu Leu Thr Asp Gly Arg Phe Ser Gly Gly Ser His Gly Phe  
 500 505 510  
 Val Val Gly His Ile Cys Pro Glu Ala Gln Glu Gly Gly Pro Ile Gly  
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 530 535 540  
 Ile Asp Val Asp Leu Thr Glu Gln Gln Leu Glu Glu Arg Arg Arg Lys  
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 <212> DNA  
 <213> Glycine max

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<211> 601  
<212> PRT  
<213> Glycine max

<400> 4  
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Ala Ser Ile Ala Val Glu Thr Pro Thr Glu Thr Val Lys Leu Asn Lys  
35 40 45

Tyr Ser Ser Arg Ile Thr Glu Pro Lys Ser Gln Gly Ala Ser Gln Ala  
50 55 60

Val Leu Tyr Gly Val Gly Leu Ser Glu Asp Asp Met Ala Lys Pro Gln  
65 70 75 80

Val Gly Val Ser Ser Val Trp Tyr Glu Gly Asn Thr Cys Asn Met His  
85 90 95

Leu Leu His Leu Ser Glu Ala Val Arg Asp Gly Val Ala Ala Ala Gly  
100 105 110

Met Val Pro Phe Arg Phe Asn Thr Val Gly Val Ser Asp Ala Ile Ser  
115 120 125

Met Gly Thr Arg Gly Met Cys Tyr Ser Leu Gln Ser Arg Asp Leu Ile  
130 135 140

Ala Asp Ser Ile Glu Thr Val Met Ala Ala Gln Trp Tyr Asp Gly Asn  
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Ile Ser Ile Pro Gly Cys Asp Lys Asn Met Pro Gly Thr Ile Ile Ala  
165 170 175

Met Gly Arg Leu Asn Arg Pro Ser Ile Met Val Tyr Gly Gly Thr Ile  
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 Lys Pro Gly His Phe Glu Gly Asn Thr Phe Asp Ile Val Ser Ala Phe  
 195 200 205  
 Gln Cys Tyr Gly Glu Tyr Val Ser Gly Ser Ile Asn Asp Asp Gln Arg  
 210 215 220  
 Gln Asn Val Ile Arg Asn Ser Cys Pro Gly Ala Gly Ala Cys Gly Gly  
 225 230 235 240  
 Met Tyr Thr Ala Asn Thr Met Ala Ser Ala Ile Glu Ala Met Gly Met  
 245 250 255  
 Ser Leu Pro Tyr Ser Ser Ser Thr Pro Ala Glu Asp Pro Leu Lys Leu  
 260 265 270  
 Asp Glu Cys Arg Leu Ala Gly Lys Tyr Leu Leu Glu Leu Leu Lys Met  
 275 280 285  
 Asp Leu Lys Pro Arg Asp Ile Ile Thr Arg Lys Ser Leu Arg Asn Ala  
 290 295 300  
 Met Val Ile Val Met Ala Leu Gly Gly Ser Thr Asn Ala Val Leu His  
 305 310 315 320  
 Leu Ile Ala Ile Ala Lys Ser Val Gly Ile Asp Leu Thr Leu Asp Asp  
 325 330 335  
 Phe Gln Lys Val Ser Asp Glu Val Pro Phe Ile Ala Asp Leu Lys Pro  
 340 345 350  
 Ser Gly Lys Tyr Val Met Glu Asp Val His Lys Ile Gly Gly Thr Pro  
 355 360 365  
 Ala Val Ile Arg Tyr Leu Leu Glu Gln Gly Phe Leu Asp Gly Asp Cys  
 370 375 380  
 Met Thr Val Thr Gly Lys Thr Leu Ala Glu Asn Ala Glu Leu Val Pro  
 385 390 395 400  
 Pro Leu Ser Asn Gly Gln Glu Ile Ile Arg Pro Val Glu Asn Pro Ile  
 405 410 415  
 Lys Lys Thr Ala His Ile Gln Ile Leu Tyr Gly Asn Leu Ala Pro Gln  
 420 425 430  
 Gly Ser Val Ala Lys Ile Thr Gly Lys Glu Gly Leu Tyr Phe Ser Gly  
 435 440 445  
 Pro Ala Leu Val Phe Glu Gly Glu Ala Met Ile Ala Ala Ile Ser  
 450 455 460  
 Glu Asp Pro Ser Ser Phe Lys Gly Lys Val Val Val Ile Arg Gly Glu  
 465 470 475 480  
 Gly Pro Lys Gly Gly Pro Gly Met Pro Glu Met Leu Thr Pro Thr Ser  
 485 490 495  
 Ala Ile Met Gly Ala Gly Leu Gly Lys Glu Val Ala Leu Leu Thr Asp  
 500 505 510  
 Gly Arg Phe Ser Gly Gly Ser His Gly Phe Val Val Gly His Ile Cys  
 515 520 525

Pro Glu Ala Gln Glu Gly Gly Pro Ile Gly Leu Ile Gln Asn Gly Asp  
530 535 540

Val Ile Asn Val Asp Ile Lys Asn Arg Arg Ile Asp Val Leu Val Ser  
545 550 555 560

Asp Glu Glu Met Glu Ala Arg Arg Lys Lys Trp Thr Ala Pro Pro Tyr  
565 570 575

Lys Ala Asn Arg Gly Ala Leu Tyr Lys Tyr Ile Lys Asn Val Thr Pro  
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Ala Ser Ser Gly Cys Val Thr Asp Glu  
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<212> DNA  
<213> Triticum aestivum

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<221> unsure  
<222> (447)

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tttcaaggga aagggtttag tgatccgagg agaaggacca aaaggaggtc ccgggatgcc 180  
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gaaatggagc cccgcctccac acaaggntac taatgggagc acttttggaaag tacataaagc 480  
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<212> PRT  
<213> Triticum aestivum

<220>  
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Phe Ser Gly Pro Ala Leu Val Phe Asp Gly Glu Glu Ser Met Ile Thr  
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Ala Ile Ser Glu Asn Pro Ala Asn Phe Lys Gly Lys Val Val Val Ile  
35 40 45

Arg Gly Glu Gly Pro Lys Gly Gly Pro Gly Met Pro Glu Met Leu Thr  
50 55 60

Pro Thr Ser Ala Ile Met Gly Ala Gly Leu Gly Lys Glu Cys Ala Leu  
65 70 75 80

Leu Thr Asp Gly Arg Phe Ser Gly Gly Ser His Gly Phe Val Val Gly  
85 90 95

His Val Cys Pro Glu Ala Gln Glu Gly Gly Pro Ile Gly Leu Val Glu  
100 105 110

Asn Gly Asp Thr Ile Thr Ile Asp Val Gly Lys Lys Val Ile Asp Val  
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Pro Pro His Lys Xaa Thr Asn Gly Ser Thr Leu Glu  
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<210> 7  
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<212> PRT  
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Pro Lys Gly Gln Gly Ala Ser Gln Ala Met Leu Tyr Ala Thr Gly Phe  
35 40 45

Lys Lys Glu Asp Phe Lys Lys Pro Gln Val Gly Val Gly Ser Cys Trp  
50 55 60

Trp Ser Gly Asn Pro Cys Asn Met His Leu Leu Asp Leu Asn Asn Arg  
65 70 75 80

Cys Ser Gln Ser Ile Glu Lys Ala Gly Leu Lys Ala Met Gln Phe Asn  
85 90 95

Thr Ile Gly Val Ser Asp Gly Ile Ser Met Gly Thr Lys Gly Met Arg  
100 105 110

Tyr Ser Leu Gln Ser Arg Glu Ile Ile Ala Asp Ser Phe Glu Thr Ile  
115 120 125

Met Met Ala Gln His Tyr Asp Ala Asn Ile Ala Ile Pro Ser Cys Asp  
130 135 140

Lys Asn Met Pro Gly Val Met Met Ala Met Gly Arg His Asn Arg Pro  
145 150 155 160

Ser Ile Met Val Tyr Gly Gly Thr Ile Leu Pro Gly His Pro Thr Cys  
165 170 175

Gly Ser Ser Lys Ile Ser Lys Asn Ile Asp Ile Val Ser Ala Phe Gln  
180 185 190

Ser Tyr Gly Glu Tyr Ile Ser Lys Gln Phe Thr Glu Glu Arg Glu  
195 200 205

Asp Val Val Glu His Ala Cys Pro Gly Pro Gly Ser Cys Gly Gly Met  
210 215 220

Tyr Thr Ala Asn Thr Met Ala Ser Ala Ala Glu Val Leu Gly Leu Thr  
225 230 235 240

Ile Pro Asn Ser Ser Phe Pro Ala Val Ser Lys Glu Lys Leu Ala  
245 250 255

Glu Cys Asp Asn Ile Gly Glu Tyr Ile Lys Lys Thr Met Glu Leu Gly  
260 265 270

Ile Leu Pro Arg Asp Ile Leu Thr Lys Glu Ala Phe Glu Asn Ala Ile  
 275 280 285  
 Thr Tyr Val Val Ala Thr Gly Gly Ser Thr Asn Ala Val Leu His Leu  
 290 295 300  
 Val Ala Val Ala His Ser Ala Gly Val Lys Leu Ser Pro Asp Asp Phe  
 305 310 315 320  
 Gln Arg Ile Ser Asp Thr Thr Pro Leu Ile Gly Asp Phe Lys Pro Ser  
 325 330 335  
 Gly Lys Tyr Val Met Ala Asp Leu Ile Asn Val Gly Gly Thr Gln Ser  
 340 345 350  
 Val Ile Lys Tyr Leu Tyr Glu Asn Asn Met Leu His Gly Asn Thr Met  
 355 360 365  
 Thr Val Thr Gly Asp Thr Leu Ala Glu Arg Ala Lys Lys Ala Pro Ser  
 370 375 380  
 Leu Pro Glu Gly Gln Glu Ile Ile Lys Pro Leu Ser His Pro Ile Lys  
 385 390 395 400  
 Ala Asn Gly His Leu Gln Ile Leu Tyr Gly Ser Leu Ala Pro Gly Gly  
 405 410 415  
 Ala Val Gly Lys Ile Thr Gly Lys Glu Gly Thr Tyr Phe Lys Gly Arg  
 420 425 430  
 Ala Arg Val Phe Glu Glu Gly Ala Phe Ile Glu Ala Leu Glu Arg  
 435 440 445  
 Gly Glu Ile Lys Lys Gly Glu Lys Thr Val Val Val Ile Arg Tyr Glu  
 450 455 460  
 Gly Pro Arg Gly Ala Pro Gly Met Pro Glu Met Leu Lys Pro Ser Ser  
 465 470 475 480  
 Ala Leu Met Gly Tyr Gly Leu Gly Lys Asp Val Ala Leu Leu Thr Asp  
 485 490 495  
 Gly Arg Phe Ser Gly Gly Ser His Gly Phe Leu Ile Gly His Ile Val  
 500 505 510  
 Pro Glu Ala Ala Glu Gly Gly Pro Ile Gly Leu Val Arg Asp Gly Asp  
 515 520 525  
 Glu Ile Ile Ile Asp Ala Asp Asn Asn Lys Ile Asp Leu Leu Val Ser  
 530 535 540  
 Asp Lys Glu Met Ala Gln Arg Lys Gln Ser Trp Val Ala Pro Pro Pro  
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 Ala Ser Asn Gly Cys Val Leu Asp Ala  
 580 585

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 <212> DNA  
 <213> Zea mays

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gccccgtcta ttccatgtca gaatcgctt tattcgatct cgtcattccc actaaaggct 180  
ggacctgtaa gggcatgcag agcttttagca agcaactaca cggaaacatc tgaaacagtt 240  
gattggact gggagaacct gggtttggg atttgcaaaa ctgattatat gtatattgct 300  
aagtgcggga cagacggaa ttttctgag ggtgaaatgg tgcccttggg acctatacg 360  
ctgagtcctt cttctggagt cctaaattat ggacaggat tggggctggg cctaaaggcg 420  
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<210> 9  
<211> 153  
<212> PRT  
<213> Zea mays

<400> 9  
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Gln Asn Arg Leu Tyr Ser Ile Ser Ser Phe Pro Leu Lys Ala Gly Pro  
35 40 45  
Val Arg Ala Cys Arg Ala Leu Ala Ser Asn Tyr Thr Gln Thr Ser Glu  
50 55 60  
Thr Val Asp Leu Asp Trp Glu Asn Leu Gly Phe Gly Ile Val Gln Thr  
65 70 75 80  
Asp Tyr Met Tyr Ile Ala Lys Cys Gly Thr Asp Gly Asn Phe Ser Glu  
85 90 95  
Gly Glu Met Val Pro Phe Gly Pro Ile Ala Leu Ser Pro Ser Ser Gly  
100 105 110  
Val Leu Asn Tyr Gly Gln Gly Leu Phe Glu Gly Leu Lys Ala Tyr Lys  
115 120 125  
Lys Thr Asp Gly Ser Ile Leu Phe Arg Pro Glu Glu Asn Ala Glu  
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Arg Met Arg Thr Gly Ala Glu Arg Met  
145 150

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<212> DNA  
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ctccagatgg gcaatgtgga ggactggatc ggttggacca tgcaacttaa tcagtagcgg 600  
atcacagata ttgccttggc agatccggta ttattacagc tactgggtgc gatagtttt 660  
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<212> PRT  
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<400> 11  
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Lys Glu Gly Leu Ser Pro Ile Asn Leu Ile Val Glu Asp Lys Phe His  
20 25 30  
Arg Ala Ser Pro Gly Gly Thr Gly Val Lys Thr Ile Gly Asn Tyr  
35 40 45  
Ala Ser Val Leu Lys Ala Gln Lys Ile Ala Lys Gly Lys Gly Tyr Ser  
50 55 60  
Asp Val Leu Tyr Leu Asp Ala Val His Asp Lys Tyr Leu Glu Glu Val  
65 70 75 80  
Ser Ser Cys Asn Ile Phe Val Val Lys Asp Asn Val Ile Ser Thr Pro  
85 90 95  
Ala Ile Lys Gly Thr Ile Leu Pro Gly Ile Thr Arg Lys Ser Ile Ile  
100 105 110  
Glu Val Ala Gln Ser Lys Gly Phe Lys Val Glu Glu Arg Leu Val Cys  
115 120 125  
Val Asp Glu Leu Ile Asn Ala Asp Glu Val Phe Cys Thr Gly Thr Ala  
130 135 140  
Val Val Val Ser Pro Val Gly Ser Val Thr Tyr Met Gly Lys Arg Val  
145 150 155 160  
Glu Tyr Gly Asn Gln Gly Val Gly Val Val Ser Gln Gln Leu Tyr Lys  
165 170 175  
Ser Leu Thr Ser Leu Gln Met Gly Asn Val Glu Asp Trp Met Gly Trp  
180 185 190  
Thr Met Gln Leu Asn Gln  
195

<210> 12  
<211> 445  
<212> DNA  
<213> Zea mays

<220>  
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<222> (252)

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Zea mays

<220>  
<221> unsure  
<222> (356)

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acgcgcagaaga gcgtcatcga gctcgccagg gaccgcggat acaaggttga ggaacgcctg 120  
gtttccatcg acgatctggt ggccgcagac gaggtgttct gcaccggggac cgcgggtgg 180  
gttgctcccg tgcgtacact cacgtaccag ggcgagaggt atgagttcag aacggggccg 240  
gacaagggtgt cncaggagct gtacacgacg ctgacatcca tttagatggg catggccccc 300  
gaggacagca ngggatggac agtaccagta gactanatta ataagggttgg ggaatncatc 360  
nccacaacnt tgtttccaca tcantattgt canccgtaa aatgcatact cggttatnac 420  
atatgtgtgt ngcacanttg aaaaa 445

<210> 13  
<211> 115  
<212> PRT  
<213> Zea mays

<220>  
<221> UNSURE  
<222> (104)

<220>  
<221> UNSURE  
<222> (112)

<400> 13  
Val Val Lys Gly Gly Val Val Ala Thr Pro Asp Thr Arg Gly Thr Ile  
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Leu Pro Gly Ile Thr Arg Lys Ser Val Ile Glu Leu Ala Arg Asp Arg  
20 25 30  
Gly Tyr Lys Val Glu Glu Arg Leu Val Ser Ile Asp Asp Leu Val Ala  
35 40 45

Ala Asp Glu Val Phe Cys Thr Gly Thr Ala Val Val Val Ala Pro Val  
50 55 60

Ser Thr Val Thr Tyr Gln Gly Glu Arg Tyr Glu Phe Arg Thr Gly Pro  
65 70 75 80

Asp Thr Val Ser Gln Glu Leu Tyr Thr Thr Leu Thr Ser Ile Gln Met  
85 90 95

Gly Met Ala Ala Glu Asp Ser Xaa Gly Trp Thr Val Pro Val Glu Xaa  
100 105 110

Ile Asn Lys  
115

<210> 14

<211> 1086

<212> DNA

<213> Oryza sativa

<400> 14

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gtcgatcatg ctgttccggc cggaggagaa cgcgcggcgg atgcagcacg gcccggacg 180  
catgtgcattt cgcgtccgt cggtggagca gttcgccac gccgtcaagg agaccgtct 240  
cgccaaaccgc cgctgggtgc caccgcagg aaaggggcg ctgtacatca ggccgctgct 300  
catcgggagc ggaccgattt tcgggctggc tcccgccccg gagtagacacgt tcctcatcta 360  
cgccgcacccg gttggAACGT acttcaaggaa gggtctagcg ccgataaaacc ttgtcgtaga 420  
ggactcgata caccggggcca tgccgggccc caccgggtgg gtcaagacga tcaccaacta 480  
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cctcgacgcg gtgcacaaga cgtacctggc ggaggccctcc tcctgcaacc tcttcatcgt 600  
caaggacggc gtcgtccca cgcggccac cgtggaaacc atcctgcccgg gatatcacgcg 660  
caagagcgtc atcgagctcg ccaggggaccg cggctatcag gttgaagaac ggctcgcttc 720  
catcgacat ctggtcggcg cagacgaggt gttctgcacc ggaacagcgg tggtcgttgc 780  
cccagtatcg agtgttactt accatggca aaggtagcag ttcaggactg gacatgacac 840  
gttatcgacg acactgcaca cgactctgac gtccatccag atgggcctgg ctgaggacaa 900  
gaaaggatgg acatggcaa tagattaagg atggattatg ggcaaaggaa tcccgattat 960  
tcctcatgtc atccaatgt aattttgtc gttttatata tcttcgttaa ggcacagtga 1020  
tcacagcgcgca agtggaaattt ggacgaacag gaagcaaatg cagatcatct tactcgtaa 1080  
aaaaaaaaa 1086

<210> 15

<211> 307

<212> PRT

<213> Oryza sativa

<400> 15

Glu Gly Ile Leu Ser Arg Tyr Gly Asn Ile Glu Leu Ser Pro Ser Ser  
1 5 10 15

Gly Val Ile Asn Tyr Gly Gln Gly Leu Phe Glu Gly Leu Lys Ala Tyr  
20 25 30

Arg Ala Ala Asn Gln Gln Gly Ser Tyr Met Leu Phe Arg Pro Glu Glu  
35 40 45

Asn Ala Arg Arg Met Gln His Gly Ala Glu Arg Met Cys Met Pro Ser  
50 55 60

Pro Ser Val Glu Gln Phe Val His Ala Val Lys Gln Thr Val Leu Ala  
65 70 75 80

Asn Arg Arg Trp Val Pro Pro Gln Gly Lys Gly Ala Leu Tyr Ile Arg  
85 90 95

Pro Leu Leu Ile Gly Ser Gly Pro Ile Leu Gly Leu Ala Pro Ala Pro  
100 105 110

Glu Tyr Thr Phe Leu Ile Tyr Ala Ala Pro Val Gly Thr Tyr Phe Lys  
115 120 125

Glu Gly Leu Ala Pro Ile Asn Leu Val Val Glu Asp Ser Ile His Arg  
130 135 140

Ala Met Pro Gly Gly Thr Gly Gly Val Lys Thr Ile Thr Asn Tyr Ala  
145 150 155 160

Pro Val Leu Lys Ala Gln Met Asp Ala Lys Ser Ile Gly Phe Thr Asp  
165 170 175

Val Leu Tyr Leu Asp Ala Val His Lys Thr Tyr Leu Glu Glu Ala Ser  
180 185 190

Ser Cys Asn Leu Phe Ile Val Lys Asp Gly Val Val Ala Thr Pro Ala  
195 200 205

Thr Val Gly Thr Ile Leu Pro Gly Ile Thr Arg Lys Ser Val Ile Glu  
210 215 220

Leu Ala Arg Asp Arg Gly Tyr Gln Val Glu Glu Arg Leu Val Ser Ile  
225 230 235 240

Asp Asp Leu Val Gly Ala Asp Glu Val Phe Cys Thr Gly Thr Ala Val  
245 250 255

Val Val Ala Pro Val Ser Ser Val Thr Tyr His Gly Gln Arg Tyr Glu  
260 265 270

Phe Arg Thr Gly His Asp Thr Leu Ser Gln Thr Leu His Thr Thr Leu  
275 280 285

Thr Ser Ile Gln Met Gly Leu Ala Glu Asp Lys Lys Gly Trp Thr Val  
290 295 300

Ala Ile Asp  
305

<210> 16

<211> 965

<212> DNA

<213> Glycine max

<400> 16

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tgactttcct tggagttgtt agcccgatctt agaagaggctt acgtgtatgtt ccattttcta 120  
aagtttaattt tcaactccca atatcacaag ttatataaga tatatgtttt tttgaagag 180  
gctcggtccg aattcggcac gagaaaaatg gagagcatc gactaattta cccgatctgc 240  
ccctcttagac attcttcctt tcttctctt catcaatctc ctttcctatg cgaaccttct 300  
ctctctctca agcttcgaaa gcagttcctt ctcacttcgc agaatgttctt ggaagccgccc 360  
tctctctca ggccttccgc cactctgtct tctgtatccctt acagttagac gattgaatta 420  
gctgatatacg aatgggacaa cttgggtttt gggcttcaac ccactgatatac 480  
atgaaatgca cacgagggtgg aaccttttcc aaaggtgaat tgcagcgttt tgggaacatc 540  
gagttgaacc cctccgctgg agtttaaacat tatggccagg gattatttga gggtttggaaa 600  
gcataaccgca aacaagatgg gagtataactc ctcttcgttc cgaaagaaaaa tggtttgcgg 660  
atgcagatag gtgcggagcg gatgtgcattt ccattcacca ctatggagca gtttggaa 720  
gctgtgaagg atactgtttt agctaacaaa cgttgggttc cccctgcagg taaagggttcc 780  
ttgttatatta gacctttgtt aatggaaatg ggacctgtac ttgggtgtgc acctgcacca 840  
gagtacacat ttctaatata tgttcacctt gttggaaactt acttcaagga aggtttggcc 900  
ccaatcaattt tgattgtaga aaatgaattt catcgtaaa ctcctgggtgg cactggagct 960  
cgtgc 965

<210> 17  
 <211> 252  
 <212> PRT  
 <213> Glycine max

<400> 17  
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 1 5 10 15

Ser Phe Leu Leu Ser His Gln Ser Pro Phe Leu Cys Glu Pro Ser Leu  
 20 25 30

Ser Leu Lys Leu Arg Lys Gln Phe Pro Leu Thr Ser Gln Asn Val Leu  
 35 40 45

Glu Ala Ala Ser Pro Leu Arg Pro Ser Ala Thr Leu Ser Ser Asp Pro  
 50 55 60

Tyr Ser Glu Thr Ile Glu Leu Ala Asp Ile Glu Trp Asp Asn Leu Gly  
 65 70 75 80

Phe Gly Leu Gln Pro Thr Asp Tyr Met Tyr Ile Met Lys Cys Thr Arg  
 85 90 95

Gly Gly Thr Phe Ser Lys Gly Glu Leu Gln Arg Phe Gly Asn Ile Glu  
 100 105 110

Leu Asn Pro Ser Ala Gly Val Leu Asn Tyr Gly Gln Gly Leu Phe Glu  
 115 120 125

Gly Leu Lys Ala Tyr Arg Lys Gln Asp Gly Ser Ile Leu Leu Phe Arg  
 130 135 140

Pro Glu Glu Asn Gly Leu Arg Met Gln Ile Gly Ala Glu Arg Met Cys  
 145 150 155 160

Met Pro Ser Pro Thr Met Glu Gln Phe Val Glu Ala Val Lys Asp Thr  
 165 170 175

Val Leu Ala Asn Lys Arg Trp Val Pro Pro Ala Gly Lys Gly Ser Leu  
 180 185 190

Tyr Ile Arg Pro Leu Leu Met Gly Ser Gly Pro Val Leu Gly Val Ala  
 195 200 205

Pro Ala Pro Glu Tyr Thr Phe Leu Ile Tyr Val Ser Pro Val Gly Asn  
 210 215 220

Tyr Phe Lys Glu Gly Leu Ala Pro Ile Asn Leu Ile Val Glu Asn Glu  
 225 230 235 240

Phe His Arg Ala Thr Pro Gly Gly Thr Gly Ala Arg  
 245 250

<210> 18  
 <211> 1501  
 <212> DNA  
 <213> Triticum aestivum

<400> 18  
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 ggcaaggagc agcccgttt ccgcctgtat gacggcatca tacaacacag gaactccgga 180  
 ccttagtcac ttgcactggg agactttgg atttcaactg gtcccgacgg actttatgtta 240  
 tataatgaaa tggtcgatc atgggggttt caccaagggt gaattgggtc catatgggcc 300  
 aatcgagctg aaccctgctg ctgcagttt aaattatggc caggattgc tcgaaggct 360

tagagcacac agaaaggagg atggttcagt agttgtttt cgccccaagg aaaacgcgtt 420  
 gcggatgagg ataggtgcag atcggttatg catgcctgca ccaagcgttg agcaggccct 480  
 atcagctgtc aagcacacta tattggcaaa caagcgttgg gtacccccccttggcaaagg 540  
 ttctttatat atcaggccgc tgctgattgg aagtggagct atgcttaggtg tagcaectgc 600  
 cccggagttt acattttttg tttatgtttt cccagtttgtt cactatttca aggtggccct 660  
 gtcaccaattt agcttatgttga ctgaggaaga atatcaccgc gctgcacctg gtggactgg 720  
 tgatattaag acaattggaa attatgtttc gttttagt gctcagagaa gagccaaggaa 780  
 gaaaggcat tctgtatgttca ttacttggta tccctgtcat aagaagtttggagaaagg 840  
 ttcttcctgt aataatattga tggtaaggaa taatgttattt tacttccac tattaaacggg 900  
 aacaattttt cctggaatca caagaagaag tataattgaa attgccccaa atcttggaaat 960  
 ccaggtcgaa gagcgcctta ttgcgataga tgatgtctt gacgctgtat aagtcttctg 1020  
 tacagggact gccgttgatc tatcaccctgttggccattt gtttccattt gtgtaccacg gaagaagagt 1080  
 ggagatgggg ggcgggaagg tcggagcgtt gtcccgacaa ctgtattcgg cacttacagc 1140  
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 tcatcatctg gacggctctt acggcctcc tcggcaagaa aacaatgcaaa aatcaactga 1260  
 ccctctgtca ggaaattttt cagaatgttag aatagcataaa ttccctgtg aagatagcaa 1320  
 gaggacaca cacaacatag catcaagctg gatcagaaag attaataata atgattaaat 1380  
 agctgttgtt tcttcttcatc ctgtttccca agaggactga atgcgttttggatgtgaata 1440  
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 a 1501

<210> 19  
 <211> 348  
 <212> PRT  
 <213> Triticum aestivum

<400> 19  
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 Trp Glu Thr Leu Gly Phe Gln Leu Val Pro Thr Asp Phe Met Tyr Ile  
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 Met Lys Cys Ser Ser Asp Gly Val Phe Thr Lys Gly Glu Leu Val Pro  
 35 40 45  
 Tyr Gly Pro Ile Glu Leu Asn Pro Ala Ala Ala Val Leu Asn Tyr Gly  
 50 55 60  
 Gln Gly Leu Leu Glu Gly Leu Arg Ala His Arg Lys Glu Asp Gly Ser  
 65 70 75 80  
 Val Val Val Phe Arg Pro Lys Glu Asn Ala Leu Arg Met Arg Ile Gly  
 85 90 95  
 Ala Asp Arg Leu Cys Met Pro Ala Pro Ser Val Glu Gln Phe Leu Ser  
 100 105 110  
 Ala Val Lys His Thr Ile Leu Ala Asn Lys Arg Trp Val Pro Pro Thr  
 115 120 125  
 Gly Lys Gly Ser Leu Tyr Ile Arg Pro Leu Leu Ile Gly Ser Gly Ala  
 130 135 140  
 Met Leu Gly Val Ala Pro Ala Pro Glu Tyr Thr Phe Val Val Tyr Val  
 145 150 155 160  
 Cys Pro Val Gly His Tyr Phe Lys Asp Gly Leu Ser Pro Ile Ser Leu  
 165 170 175  
 Leu Thr Glu Glu Glu Tyr His Arg Ala Ala Pro Gly Gly Thr Gly Asp  
 180 185 190  
 Ile Lys Thr Ile Gly Asn Tyr Ala Ser Val Val Ser Ala Gln Arg Arg  
 195 200 205

Ala Lys Glu Lys Gly His Ser Asp Val Leu Tyr Leu Asp Pro Val His  
 210 215 220  
 Lys Lys Phe Val Glu Glu Val Ser Ser Cys Asn Ile Leu Met Val Lys  
 225 230 235 240  
 Asp Asn Val Ile Ser Thr Pro Leu Leu Thr Gly Thr Ile Leu Pro Gly  
 245 250 255  
 Ile Thr Arg Arg Ser Ile Ile Glu Ile Ala Gln Asn Leu Gly Ile Gln  
 260 265 270  
 Val Glu Glu Arg Leu Ile Ala Ile Asp Glu Leu Leu Asp Ala Asp Glu  
 275 280 285  
 Val Phe Cys Thr Gly Thr Ala Val Val Leu Ser Pro Val Gly Ser Ile  
 290 295 300  
 Val Tyr His Gly Arg Arg Val Glu Tyr Gly Gly Lys Val Gly Ala  
 305 310 315 320  
 Val Ser Gln Gln Leu Tyr Ser Ala Leu Thr Ala Ile Gln Lys Gly Leu  
 325 330 335  
 Val Glu Asp Ser Met Gly Trp Ser Val Gln Leu Asn  
 340 345  
 <210> 20  
 <211> 363  
 <212> PRT  
 <213> Bacillus subtilis  
 <400> 20  
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 20 25 30  
 Met Phe Val Met Asp Tyr Ala Ala Asp Lys Gly Trp Tyr Asp Pro Arg  
 35 40 45  
 Ile Ile Pro Tyr Gln Pro Leu Ser Met Asp Pro Thr Ala Met Val Tyr  
 50 55 60  
 His Tyr Gly Gln Thr Val Phe Glu Gly Leu Lys Ala Tyr Val Ser Glu  
 65 70 75 80  
 Asp Asp His Val Leu Leu Phe Arg Pro Glu Lys Asn Met Glu Arg Leu  
 85 90 95  
 Asn Gln Ser Asn Asp Arg Leu Cys Ile Pro Gln Ile Asp Glu Glu Gln  
 100 105 110  
 Val Leu Glu Gly Leu Lys Gln Leu Val Ala Ile Asp Lys Asp Trp Ile  
 115 120 125  
 Pro Asn Ala Glu Gly Thr Ser Leu Tyr Ile Arg Pro Phe Ile Ile Ala  
 130 135 140  
 Thr Glu Pro Phe Leu Gly Val Ala Ala Ser His Thr Tyr Lys Leu Leu  
 145 150 155 160  
 Ile Ile Leu Ser Pro Val Gly Ser Tyr Tyr Lys Glu Gly Ile Lys Pro  
 165 170 175

Val Lys Ile Ala Val Glu Ser Glu Phe Val Arg Ala Val Lys Gly Gly  
180 185 190

Thr Gly Asn Ala Lys Thr Ala Gly Asn Tyr Ala Ser Ser Leu Lys Ala  
195 200 205

Gln Gln Val Ala Glu Glu Lys Gly Phe Ser Gln Val Leu Trp Leu Asp  
210 215 220

Gly Ile Glu Lys Lys Tyr Ile Glu Glu Val Gly Ser Met Asn Ile Phe  
225 230 235 240

Phe Lys Ile Asn Gly Glu Ile Val Thr Pro Met Leu Asn Gly Ser Ile  
245 250 255

Leu Glu Gly Ile Thr Arg Asn Ser Val Ile Ala Leu Leu Lys His Trp  
260 265 270

Gly Leu Gln Val Ser Glu Arg Lys Ile Ala Ile Asp Glu Val Ile Gln  
275 280 285

Ala His Lys Asp Gly Ile Leu Glu Ala Phe Gly Thr Gly Thr Ala  
290 295 300

Ala Val Ile Ser Pro Val Gly Glu Leu Ile Trp Gln Asp Glu Thr Leu  
305 310 315 320

Ser Ile Asn Asn Gly Glu Thr Gly Glu Ile Ala Lys Lys Leu Tyr Asp  
325 330 335

Thr Ile Thr Gly Ile Gln Lys Gly Ala Val Ala Asp Glu Phe Gly Trp  
340 345 350

Thr Thr Glu Val Ala Ala Leu Thr Glu Ser Lys  
355 360

<210> 21

<211> 1162

<212> DNA

<213> Glycine max

<400> 21

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agcgccggcg gcggcgactt cctcctgtcc tccgcccgtc gcggccggcc ggcgttctac 180  
gccgtcgta tccccaccga ctactcccag tgccgccaacg gcgtgcgcgc ggtgaccacg 240  
tcggtgccca tgaagccgcc gctttcgcc accatgaaga acgtcaacta cctcccaac 300  
gtgctgtcca tcatggacgc cgaggaccgc ggcgcgttcg cgtcggtgtg ggtggacggc 360  
gaggcaacg tcggcgaggg gcccatggta aacgtggcgt tcgtcacggc cgccggcgag 420  
ctgggtctca cggcggttcga caagatccgc gccgggtgca cggccaacg gctgctcgcg 480  
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gccgacgagg ccaagcgctg ctccggcag atggcggttcg tcggcagcgg cttccccgtc 600  
ctgcccattcg tcgagtggta cgaccagctc atcgccgacgc ggaagggtgg gaagacgatg 660  
atggcgctgt cggatctgtc ctgggaggac atgaaatcgg ggccggacag gatcgacgtc 720  
ccgtacaagt gatggattat tggagttggg tgaggctctt cggcgatcgtc tcagaaaagag 780  
gtgtgctacc gacgtgtgga ttcatgacgg taagttcac ctgttaggta ttcacgtctc 840  
ttcgacttta tatgagagga gctacgtcca tcggagatag gaggagaagg gcaacgtgcc 900  
gagtatatat gtgttagtcta cgtacgcgtg agcgagctga gatggatatg atgcagttac 960  
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acgtgtcgtc aacgtaatcc ttgtatggc cggtgtatca gtactgtatg agtgtatgt 1080  
tttatacgatt gatcattaaag tgaatgaata atggattctc tcgattcaa atgtaaaaaa 1140  
aaaaaaaaaaaaaa aa 1162

<210> 22

<211> 243

<212> PRT  
 <213> Glycine max  
  
 <400> 22  
 Ala Arg Val Gln Pro Lys Ala Arg Ile Gly Thr Pro Phe Pro Arg Asp  
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 Thr Leu Arg Ser Ile Leu Val Gln Met Thr Ala Ala Ser Asn Cys Arg  
   20               25               30  
  
 Arg Gly Ser Ile Arg Tyr Trp Leu Ser Ala Gly Gly Asp Phe Leu  
   35               40               45  
  
 Leu Ser Ser Ala Gly Cys Ala Gly Pro Ala Phe Tyr Ala Val Val Ile  
   50               55               60  
  
 Pro Thr Asp Tyr Ser Gln Cys Arg His Gly Val Arg Ala Val Thr Thr  
   65               70               75               80  
  
 Ser Val Pro Met Lys Pro Pro Leu Phe Ala Thr Met Lys Asn Val Asn  
   85               90               95  
  
 Tyr Leu Pro Asn Val Leu Ser Ile Met Asp Ala Glu Asp Arg Gly Ala  
   100              105              110  
  
 Phe Ala Ser Val Trp Val Asp Gly Glu Gly Asn Val Ala Glu Gly Pro  
   115              120              125  
  
 Met Val Asn Val Ala Phe Val Thr Ala Ala Gly Glu Leu Val Leu Pro  
   130              135              140  
  
 Ala Phe Asp Lys Ile Leu Ala Gly Cys Thr Ala Lys Arg Leu Leu Ala  
   145              150              155              160  
  
 Leu Ala Pro Arg Leu Val Glu Ser Gly Leu Leu Lys Ala Val Thr Thr  
   165              170              175  
  
 Arg His Ile Ala Ala Asp Glu Ala Lys Arg Cys Ser Ala Glu Met Ala  
   180              185              190  
  
 Phe Val Gly Ser Gly Leu Pro Val Leu Pro Ile Val Glu Trp Asp Asp  
   195              200              205  
  
 Gln Leu Ile Gly Asp Gly Lys Val Gly Lys Thr Met Met Ala Leu Ser  
   210              215              220  
  
 Asp Leu Leu Trp Glu Asp Met Lys Ser Gly Pro Asp Arg Ile Ala Val  
   225              230              235              240  
  
 Pro Tyr Lys

<210> 23  
 <211> 1045  
 <212> DNA  
 <213> Glycine max  
  
 <400> 23  
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 tttaaaggta ccatccatgt ctaaaataga tcccccattt gatcgaggaa gcataagaag   180  
 aataactcata caaactgtaa gtgcctccaa gtgtagaaaa ggatcactaa gatattggct   240  
 ctcggcagga cctggcgaact ttcatgttac tccctcttgt tgccaccgat caagtctgta   300  
 tgcgatagta atacaggatc tgtcaccatc ctcacctaatt tcagggcg taaaaggtagt   360  
 cacttcatct attcccatta aacaccccaa gtttgctatc actaagagtg tgaactatct   420  
 tccaaatgtg ctctcaaagg tggaagctga agaagctggt gctttgttag gcatttggct   480

tgatggtgaa ggttttgtt ctgaaggccc taatatgaat gtggccttg tcactaaaga 540  
 taaggaacctt ataatgccac actttgacaa aattctaagt ggctgcacag ctaagagagt 600  
 tttaaccctt gctgagagct ttttaaggga gggtaagctt aaagggataa gggtaaaaac 660  
 tttgactgtc gaggaaggta agcaagcaga taaaatgtatg ctcttggca gcggagttct 720  
 ttttgcctt gtagtcaat gggatgagca gttattggat gatggcaaag aaggccctat 780  
 aacgcaggct ctcttaatc taattgttga ggacatgaaa tcaggtccct ccactgttcg 840  
 tatacctgtt ctttatttgc acaactttat ttccttctct tcattttgtt atgaagatta 900  
 atcagtagtt gtgatgcccc tacttctaca gggaggaatg actattaata acttcattgt 960  
 ctaatggttt ttagagcttg tagtgttata agaaactcta ttccatggag cttagtttc 1020  
 aaatgtttt gtggctaaa aaaaa 1045

<210> 24  
 <211> 285  
 <212> PRT  
 <213> Glycine max

<400> 24  
 His Glu Ala Met Val Ile Pro Met Asp Asp His Met Val His Arg Gly  
 1 5 10 15

His Gly Val Phe Asp Thr Ala Ala Ile Met Asp Gly Tyr Leu Tyr Glu  
 20 25 30

Leu Asp Gln His Leu Asp Arg Phe Leu Arg Ser Ala Ser Met Ser Lys  
 35 40 45

Ile Asp Pro Pro Phe Asp Arg Gly Ser Ile Arg Arg Ile Leu Ile Gln  
 50 55 60

Thr Val Ser Ala Ser Lys Cys Arg Lys Gly Ser Leu Arg Tyr Trp Leu  
 65 70 75 80

Ser Ala Gly Pro Gly Asp Phe Gln Leu Ser Pro Ser Cys Cys His Arg  
 85 90 95

Ser Ser Leu Tyr Ala Ile Val Ile Gln Asp Leu Ser Pro Ser Ser Pro  
 100 105 110

Asn Phe Arg Gly Val Lys Val Val Thr Ser Ser Ile Pro Ile Lys His  
 115 120 125

Pro Lys Phe Ala Ile Thr Lys Ser Val Asn Tyr Leu Pro Asn Val Leu  
 130 135 140

Ser Lys Val Glu Ala Glu Glu Ala Gly Ala Phe Val Gly Ile Trp Leu  
 145 150 155 160

Asp Gly Glu Gly Phe Val Ala Glu Gly Pro Asn Met Asn Val Ala Phe  
 165 170 175

Val Thr Lys Asp Lys Glu Leu Ile Met Pro His Phe Asp Lys Ile Leu  
 180 185 190

Ser Gly Cys Thr Ala Lys Arg Val Leu Thr Leu Ala Glu Ser Leu Leu  
 195 200 205

Arg Glu Gly Lys Leu Lys Gly Ile Arg Val Lys Thr Val Thr Val Glu  
 210 215 220

Glu Gly Lys Gln Ala Asp Glu Met Met Leu Leu Gly Ser Gly Val Leu  
 225 230 235 240

Val Cys Pro Val Val Gln Trp Asp Glu Gln Val Ile Gly Asp Gly Lys  
 245 250 255

Glu Gly Pro Ile Thr Gln Ala Leu Leu Asn Leu Ile Val Glu Asp Met  
260 265 270

Lys Ser Gly Pro Ser Thr Val Arg Ile Pro Val Pro Tyr  
275 280 285

<210> 25

<211> 1323

<212> DNA

<213> Oryza sativa

<400> 25

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ggagaaacca ccatacccaag ctatgtattc tagtattttat ggaggtatca tacttgatcc 180  
agcaatgtatg gtaatccccca ttgtatgatca catgttcac agagggcatg gtgtgttga 240  
tacagctt gttcttagatg gatacctcta tgagttggat gttcacccct acagattccct 300  
aagttcagcc tccaaagcaa agatattc tccctttct ccatcagtc ttacacagcat 360  
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aaa 1323

<210> 26

<211> 297

<212> PRT

<213> Oryza sativa

<400> 26

Met Tyr Ser Ser Ile Tyr Gly Ile Ile Leu Asp Pro Ala Met Met  
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Val Ile Pro Ile Asp Asp His Met Val His Arg Gly His Gly Val Phe  
20 25 30

Asp Thr Ala Ile Val Leu Asp Gly Tyr Leu Tyr Glu Leu Asp Val His  
35 40 45

Leu Asp Arg Phe Leu Ser Ser Ala Ser Lys Ala Lys Ile Ser Ser Pro  
50 55 60

Phe Ser Arg Ser Val Leu His Ser Ile Leu Ile Gln Leu Thr Ala Ala  
65 70 75 80

Ser Lys Cys Lys Lys Gly Thr Leu Arg Tyr Trp Leu Ser Ala Gly Pro  
85 90 95

Gly Asp Phe Leu Leu Ser Ser Ala Gly Cys Pro Thr Ser Ala Phe Tyr  
100 105 110

Ala Val Val Ile Asp Gln Asp Val Ser Gln Cys Lys Glu Gly Val Lys  
115 120 125

Val Ile Thr Ser Asn Ile Pro Met Lys Pro Ser Leu Phe Ala Thr Ala  
 130 135 140  
 Lys Asn Val Asn Tyr Leu Pro Asn Val Leu Ser Val Met Glu Ala Glu  
 145 150 155 160  
 Glu Lys Gly Ala Ser Ser Ser Ile Trp Val Asp Glu Glu Gly Tyr Ile  
 165 170 175  
 Ala Glu Gly Pro Asn Val Asn Val Ala Phe Ile Thr Gln Asp Lys Glu  
 180 185 190  
 Leu Val Met Pro Pro Phe Asp Asn Ile Leu His Gly Cys Thr Ala Lys  
 195 200 205  
 Arg Leu Leu Glu Leu Ala Pro Lys Leu Val Asp Gln Gly Leu Leu Lys  
 210 215 220  
 Gly Val Ala Thr Lys Lys Leu Thr Val Glu Glu Ala Lys Ala Ala Ala  
 225 230 235 240  
 Glu Met Met Tyr Val Gly Ser Thr Leu Pro Leu Leu Pro Ile Ile Val  
 245 250 255  
 Trp Asp Asp Gln Pro Ile Gly Asn Gly Arg Val Gly Glu Leu Thr Met  
 260 265 270  
 Leu Leu Ser Asp Met Leu Trp Asp Asp Met Val Ala Gly Pro Gly Thr  
 275 280 285  
 Gln Arg Ile Pro Val Pro Tyr Val Glu  
 290 295  
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 <211> 542  
 <212> DNA  
 <213> Triticum aestivum  
 <400> 27  
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 ctcctcaatt tgcagtcatg aaaagcgtga attacttgcc caatgcactc accaagggtgg 180  
 aaggagaaga gaatggtgca ttactggca ttggctaga cgatgagggc ttcgttgcag 240  
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 tt 542  
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 <212> PRT  
 <213> Triticum aestivum  
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 Val Ile Glu Ser Pro Ser Leu Gln Val Pro Ser Cys Cys Arg Val Val  
 20 25 30  
 Thr Ser Ser Ile Pro Ile Lys Ser Pro Gln Phe Ala Val Met Lys Ser  
 35 40 45

Val Asn Tyr Leu Pro Asn Ala Leu Thr Lys Val Glu Gly Glu Glu Asn  
   50                       55                       60  
 Gly Ala Phe Thr Gly Ile Trp Leu Asp Asp Glu Gly Phe Val Ala Glu  
   65                       70                       75                       80  
 Gly Ser Asn Met Asn Val Gly Phe Val Thr Lys Asn Lys Glu Leu Leu  
   85                       90                       95  
 Met Pro Arg Phe Asp Lys Ile Leu Ser Gly Cys Thr Ala Arg Arg Val  
  100                      105                       110  
 Leu Thr Leu Ala Glu His Leu Val Ala His Gly Lys Leu Ser Arg Val  
  115                      120                       125  
 Ile Ser Arg Asn Val Ser Val Glu Glu Gly Lys Met Ala Asp Glu Met  
  130                      135                       140  
 Met Leu Ile Gly Ser Gly Ile Leu Val Lys Pro Val Val Gln Trp Asp  
  145                      150                       155                       160  
 Asp Lys Ile Ile Gly Ser Gly Gln Glu Gly Pro Ile Ala Gln Ala Leu  
  165                      170                       175  
 Tyr Asp Leu Ile  
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 <212> PRT  
 <213> Methanococcus jannaschii  
 <400> 29  
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 Val Ser Val Phe Asp His Gly Leu Leu Tyr Gly Asp Gly Val Phe Glu  
   20                      25                       30  
 Gly Ile Arg Ala Tyr Asp Gly Val Val Phe Met Leu Lys Glu His Ile  
   35                      40                       45  
 Asp Arg Leu Tyr Asp Ser Ala Lys Ser Leu Cys Ile Asp Ile Pro Leu  
   50                      55                       60  
 Thr Lys Glu Glu Met Ile Asp Val Val Leu Glu Thr Leu Arg Val Asn  
   65                      70                       75                       80  
 Asn Leu Arg Asp Ala Tyr Ile Arg Leu Val Val Thr Arg Gly Val Gly  
   85                      90                       95  
 Asp Leu Gly Leu Asp Pro Arg Lys Cys Gly Lys Pro Thr Ile Phe Cys  
  100                     105                       110  
 Ile Ala Ile Pro Met Pro Pro Leu Leu Gly Glu Asp Gly Ile Arg Ala  
  115                      120                       125  
 Ile Thr Val Ser Val Arg Arg Leu Pro Val Asp Val Leu Asn Pro Ala  
  130                      135                       140  
 Val Lys Ser Leu Asn Tyr Leu Asn Ser Val Leu Ala Lys Ile Gln Ala  
  145                      150                       155                       160  
 Asn Tyr Ala Gly Val Asp Glu Ala Phe Leu Leu Asp Asp Lys Gly Phe  
  165                      170                       175

Val Val Glu Gly Thr Gly Asp Asn Ile Phe Ile Val Lys Asn Gly Val  
180 185 190

Leu Lys Thr Pro Pro Val Tyr Gln Ser Ile Leu Lys Gly Ile Thr Arg  
195 200 205

Asp Val Val Ile Lys Leu Ala Lys Glu Glu Gly Ile Glu Val Val Glu  
210 215 220

Glu Pro Leu Thr Leu His Asp Leu Tyr Thr Ala Asp Glu Leu Phe Ile  
225 230 235 240

Thr Gly Thr Ala Ala Glu Ile Val Pro Val Phe Glu Ile Asp Gly Arg  
245 250 255

Val Ile Asn Asn Lys Gln Val Gly Glu Ile Thr Lys Lys Leu Lys Glu  
260 265 270

Lys Phe Lys Asp Ile Arg Thr Lys Trp Gly Ile Lys Val Tyr Asp Glu  
275 280 285

<210> 30

<211> 1062

<212> DNA

<213> Zea mays

<400> 30

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acaaggagga gatgctgttt gggaaaggttt acgtatataat gatggaaaag tattcaaatt  
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tactcgtgtat tggattaagg atgcccattt taagactctg attgcaaatg gaatgttcaa  
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tatagatccc aagatccatc acaacaatct tatcaacaat attctggcaa agatagaagg  
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<210> 31

<211> 310

<212> PRT

<213> Zea mays

<400> 31

Gln Pro Pro Leu Ser Asp Pro Pro Leu Pro Val Pro Ala Asn Lys Asn  
1 5 10 15

Ile Leu Val Trp Val Gly Asp Glu Leu Leu Pro Arg Asn Ser Ala Lys  
20 25 30

Val Ser Val Phe Asp Ser Val Val Gln Gly Gly Asp Ala Val Trp Glu  
35 40 45

Gly Leu Arg Ile Tyr Asp Gly Lys Val Phe Lys Leu Asp Glu His Leu  
50 55 60

Asp Arg Leu Phe Asp Ser Ala Lys Ala Met Ala Phe Ser Asn Val Pro  
65 70 75 80

Thr Arg Asp Trp Ile Lys Asp Ala Ile Phe Lys Thr Leu Ile Ala Asn  
85 90 95

Gly Met Phe Asn Asn Ala His Ile Arg Leu Thr Leu Thr Arg Gly Lys  
100 105 110

Lys Val Thr Ser Gly Met Ser Pro Ala Phe Asn Leu Tyr Gly Cys Ala  
115 120 125

Leu Ile Val Leu Ala Glu Trp Lys Pro Pro Val Tyr Asp Asn Ser His  
130 135 140

Gly Ile Lys Leu Val Thr Ala Thr Thr Arg Arg Asn Ser Pro Asn Ser  
145 150 155 160

Ile Asp Pro Lys Ile His His Asn Asn Leu Ile Asn Asn Ile Leu Ala  
165 170 175

Lys Ile Glu Gly Asn Leu Ala Gln Ala Glu Asp Ala Ile Met Leu Asp  
180 185 190

Lys Asp Gly Phe Val Ser Glu Thr Asn Ala Thr Asn Ile Phe Met Val  
195 200 205

Lys Lys Gly Ile Val Leu Thr Pro His Ala Asp Tyr Cys Leu Pro Gly  
210 215 220

Ile Thr Arg Ala Thr Val Met Asp Leu Val Val Lys Glu Asn Phe Val  
225 230 235 240

Leu His Glu Arg Arg Ile Ser Leu Ser Glu Phe His Ala Ala Asp Glu  
245 250 255

Val Trp Thr Thr Gly Thr Met Gly Glu Ile Thr Pro Val Val Met Ile  
260 265 270

Asp Gly Arg Glu Ile Gly Asp Gly Lys Ile Gly Pro Val Thr Arg Gln  
275 280 285

Ile Gln Lys Ala Tyr Lys Ile Leu Thr Ala Gly Gln Gly Val Pro Ile  
290 295 300

Pro Gly Val Ala Glu Val  
305 310

<210> 32

<211> 1186

<212> DNA

<213> Triticum aestivum

<400> 32

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aatgggatgt tcaataatgc acatataagg ctcactctca cccgtggaa gaaggtgaca 180  
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aattctccaa atagcgtaga ttcaagata catcacaaca atcttattaa caacattctg 360  
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gagggtgtga caaccggAAC aatgggtgaa attacaccgg ttgtgtatgt tgacggcgt 660  
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ctgacagcag gggtgggagt aacaattccc aggaatgcgg aggcataatc atttgcgcag 780  
acattcttct tgccttttg aaaaggagaa ggcacccatt atctatggac aaactttcay 840

ggttcagttt cgagtaatga taataaatac ccctccatcc ggaattactt gtcgtagaaa 900  
tgggtaaaaa tgaatgtatc tagaactaaa aatacgttt gatacatcta tttctccgac 960  
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cacaccggac agaaaactga gtattcgaaa aatactggct gggtctgtga attcatgatt 1080  
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<210> 33  
<211> 255  
<212> PRT  
<213> Triticum aestivum

<400> 33  
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1 5 10 15

Lys Ala Met Ala Phe Ser Asn Val Pro Ser Arg Asp Trp Ile Lys Asp  
20 25 30

Ala Ile Phe Lys Thr Leu Asn Ala Asn Gly Met Phe Asn Asn Ala His  
35 40 45

Ile Arg Leu Thr Leu Thr Arg Gly Lys Lys Val Thr Ser Gly Met Ser  
50 55 60

Pro Thr Phe Asn Leu Tyr Gly Cys Val Leu Ile Val Leu Ala Glu Trp  
65 70 75 80

Lys Pro Pro Val Tyr Asp Asn Ser His Gly Ile Lys Leu Val Thr Ala  
85 90 95

Ala Thr Arg Arg Asn Ser Pro Asn Ser Val Asp Ser Lys Ile His His  
100 105 110

Asn Asn Leu Ile Asn Asn Ile Leu Ala Lys Ile Glu Gly Asn Leu Ala  
115 120 125

Gln Ala Glu Asp Ala Ile Met Leu Asp Gln Asp Gly Phe Val Ser Glu  
130 135 140

Thr Asn Ala Thr Asn Ile Phe Met Val Lys Lys Gly Ile Val Leu Thr  
145 150 155 160

Pro His Ala Asp Tyr Cys Leu Pro Gly Ile Thr Arg Ala Thr Val Lys  
165 170 175

Asp Leu Val Val Lys Glu Asn Leu Val Leu His Glu Arg Arg Ile Ser  
180 185 190

Leu Ser Glu Phe His Ala Ala Asp Glu Val Trp Thr Thr Gly Thr Met  
195 200 205

Gly Glu Ile Thr Pro Val Val Met Ile Asp Gly Arg Glu Ile Gly Asp  
210 215 220

Gly Lys Ile Gly Leu Val Thr Arg Gln Ile Gln Ser Ala Tyr Lys Val  
225 230 235 240

Leu Thr Ala Gly Leu Gly Val Thr Ile Pro Arg Asn Ala Glu Ala  
245 250 255

<210> 34  
<211> 210  
<212> PRT  
<213> Escherichia coli

<400> 34  
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20 25 30

Arg Cys Tyr Asp Ser His Lys Gly Val Val Arg His Arg His Met Arg  
35 40 45

His Asp Ser Ala Lys Tyr Arg Val Ser Ser Asp Met Ala Cys Arg Asp  
50 55 60

Val Arg Lys Asn Asn Thr Ser Ala Tyr Arg Val Gly Asp Val Gly Met  
65 70 75 80

Gly Val Asn Ala Gly Tyr Ser Thr Asp Val Ala Ala Trp Gly Ala Tyr  
85 90 95

Gly Ala Ala Gly Asp Ala Met Val Ser Ser Trp Asn Arg Ala Ala Asn  
100 105 110

Thr Thr Ala Ala Lys Ala Gly Gly Asn Tyr Ser Ser Val Gly Ser Ala  
115 120 125

Arg Arg His Gly Tyr Gly Ala Asp Val Asn Gly Tyr Ser Gly Ala Gly  
130 135 140

Asn Val Lys Asp Gly Val Thr Thr Ser Ser Ala Gly Thr Arg Asp Ala  
145 150 155 160

Lys Ala Lys Gly Val Arg Val Ser Arg Ser Tyr Ala Asp Val Met Ser  
165 170 175

Gly Thr Ala Ala Thr Val Arg Ser Val Asp Gly Val Gly Gly Arg Cys  
180 185 190

Gly Val Thr Lys Arg Ala Gly Thr Gly Thr Asp Lys Trp Gly Trp Asp  
195 200 205

Val Asn  
210

<210> 35

<211> 1626

<212> DNA

<213> Zea mays

<400> 35

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gaccgcgaga aggtcgcat catccccgac cactacatct tcaccagcga cgagcgcgcc 180  
aaccgcAACG tcgatatacct cagggacttc tgcctggagc agaacatcaa gtacttctat 240  
gatatacagg acctcagcga tttcagggct aatccagact acaagggtgt ctgccacatt 300  
gcacttgctc aggaaggcca ctgcccacca ggcgagggttc tcctgggtac tgattctcat 360  
acgtgcaatg ctggagcctt tggtaattt gcaaccggaa ttggaaacac tgatgcaggt 420  
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gatggagaaa tgccgccta ttacttgcg aaggatctga ttttgc当地 tattggtag 540  
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cgtataacgtt	gtttagcggtt	acaaggggaaa	tacatttcatt	ctttccagta	tcgatggcag	1500
tcactagact	ccgttttttac	aaaaaaaaagg	catgtcgaga	gatcttgtag	ttcacataact	1560
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aaaaaaa						1626

<210> 36  
<211> 428  
<212> PRT  
<213> Zea mays

<400> 36  
Ala Arg Glu Pro Gly Glu Asn Val Trp Val Asp Ile Asp Val Leu Met  
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Thr His Asp Val Cys Gly Pro Gly Thr Ile Gly Ile Phe Lys Lys Glu  
20 25 30

Phe Gly Glu Asp Ala Lys Val Trp Asp Arg Glu Lys Val Val Ile Ile  
35 40 45

Pro Asp His Tyr Ile Phe Thr Ser Asp Glu Arg Ala Asn Arg Asn Val  
50 55 60

Asp Ile Leu Arg Asp Phe Cys Leu Glu Gln Asn Ile Lys Tyr Phe Tyr  
65 70 75 80

Asp Ile Lys Asp Leu Ser Asp Phe Arg Ala Asn Pro Asp Tyr Lys Gly  
85 90 95

Val Cys His Ile Ala Leu Ala Gln Glu Gly His Cys Arg Pro Gly Glu  
100 105 110

Val Leu Leu Gly Thr Asp Ser His Thr Cys Asn Ala Gly Ala Phe Gly  
115 120 125

Gln Phe Ala Thr Gly Ile Gly Asn Thr Asp Ala Gly Phe Val Met Gly  
130 135 140

THE GLY Lys Ala Leu Leu Lys Val Pro Pro THE Ile Arg Phe Val Leu  
145 150 155 160

Asp Gly Glu Met Phe Phe Tyr Ile Leu Ala Lys Asp Leu Ile Leu Gln  
165 170 175

116 116 116 116 116 Ser Val Ser Glu Ala Thr Tyr Lys Ser Met Glu  
180 185 190

THE VAL CITY SCI THE VAL CITY SCI BED THE HED CITY CITY ALG HED THE  
195 200 205

210 215 220

225 230 235 240

245 250 255

Arg Phe Asp Val Ser Lys Leu Glu Pro Val Val Ala Lys Pro His Ser  
260 265 270

Pro Asp Asn Arg Ala Leu Ala Arg Glu Cys Lys Asp Val Lys Ile Asp  
275 280 285

Arg Val Tyr Ile Gly Ser Cys Thr Gly Gly Lys Thr Glu Asp Phe Leu  
290 295 300

Ala Ala Ala Lys Val Phe Leu Ala Ser Gly Lys Lys Val Lys Val Pro  
305 310 315 320

Thr Phe Leu Val Pro Ala Thr Gln Lys Val Trp Met Asp Val Tyr Ser  
325 330 335

Leu Pro Val Pro Gly Ser Gly Gly Lys Thr Cys Ala Gln Ile Phe Glu  
340 345 350

Glu Ala Gly Cys Asp Thr Pro Ala Ser Pro Asn Cys Gly Ala Cys Leu  
355 360 365

Gly Gly Pro Arg Asp Thr Tyr Ala Arg Met Asn Glu Pro Thr Val Cys  
370 375 380

Val Ser Thr Thr Asn Arg Asn Phe Pro Gly Arg Met Gly His Lys Glu  
385 390 395 400

Gly Gln Ile Tyr Leu Ala Ser Pro Tyr Thr Ala Ala Ala Ser Ala Leu  
405 410 415

Thr Gly Tyr Val Thr Asp Pro Arg Asp Phe Leu Met  
420 425

<210> 37

<211> 1688

<212> DNA

<213> Zea mays

<220>

<221> unsure

<222> (1673)

<400> 37

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cccgccggac caagccgtgc agcgtgcggc cctgcgttgc gcccggcgccgc gcccgttgcgt 240  
ccacccggctc ggtgaagagc gcgatgacga tgacggagaa gatactggcg cgggcgttcgg 300  
agcgcgcggc gctggagccc ggggagaacg tgggttcga ctgcgtacgt ctcatgacgc 360  
acgacgtctg cgggccccggc gccttcgaca tcttaagaaa ggagttcggg gaggacgcca 420  
gggtctggga cgcgagaag ctgcgtca tccggacca ctacatcttc accaggcagc 480  
gccgtccaa acgcaacgtc gacatctca gggacttctg tgccggagcag aacatcaagt 540  
acttcttatga catcaaggac ctcagcgatt tcaggctaa tccggactac aaaggcgtct 600  
gccacatgc acttgcctag gaagcccact gcccggcagg cgaggttctc ttgggcactg 660  
attctcatac atgcaatgtt ggagctttt gtcagggttc aacttggaaatc ggaaacactg 720  
atgcagggtt tgggtggc actggaaagg ctcttctcaa ggtgccacct actatcagg 780  
ttatattaga tggagatg ccccttatt tacttgcga ggtatctgtt ttgcaatta 840  
ttggagatg ttcaatctt ggtgcgacat acaaataat ggttttgtt ggatcaactg 900  
tagaaagtct aaccatggaa gagcgtatga cactatgcaa catggttt gaaagctgg 960  
gaaagaacgg tgggtgcct gctgtatgaaa ctacattaa ataccttgaa ggttaagacat 1020  
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tttatgtatc aaaactggag ccagtagttt ccaagccaca ttgcctgac aaccgtgctc 1140  
cagcacgaga atgcaaatgtt gtggatgtt accggatctt tattggttt tgcactgg 1200  
gtaagaccga ggattccctt gctgtgcata aggttttctt agecctcgaaa aagaaggta 1260  
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ctgtaccagg atctgtggc aaaacttgctt cccagatatt tgaggaggct ggttgac 1380

caccagcaag tcctaattgt ggtgcttgg tgggtggccc tcgtgataca tatgcacgga 1440  
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acaaggaagg gcaaactcac ctggcgcttc cctacactgc ggctgcctca gccctgacgg 1560  
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cttcgttg 1688

<210> 38  
<211> 443  
<212> PRT  
<213> Zea mays

<400> 38  
Met Thr Met Thr Glu Lys Ile Leu Ala Arg Ala Ser Glu Arg Ala Ala  
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Leu Glu Pro Gly Glu Asn Val Trp Val Asp Val Asp Val Leu Met Thr  
20 25 30  
  
His Asp Val Cys Gly Pro Gly Ala Phe Asp Ile Phe Lys Lys Glu Phe  
35 40 45  
  
Gly Glu Asp Ala Arg Val Trp Asp Arg Glu Lys Leu Val Val Ile Pro  
50 55 60  
  
Asp His Tyr Ile Phe Thr Ser Asp Gly Arg Ala Lys Arg Asn Val Asp  
65 70 75 80  
  
Ile Leu Arg Asp Phe Cys Ala Glu Gln Asn Ile Lys Tyr Phe Tyr Asp  
85 90 95  
  
Ile Lys Asp Leu Ser Asp Phe Arg Ala Asn Pro Asp Tyr Lys Gly Val  
100 105 110  
  
Cys His Ile Ala Leu Ala Gln Glu Ala His Cys Arg Pro Gly Glu Val  
115 120 125  
  
Leu Leu Gly Thr Asp Ser His Thr Cys Asn Ala Gly Ala Phe Gly Gln  
130 135 140  
  
Phe Ala Thr Gly Ile Gly Asn Thr Asp Ala Gly Phe Val Leu Gly Thr  
145 150 155 160  
  
Gly Lys Ala Leu Leu Lys Val Pro Pro Thr Ile Arg Phe Ile Leu Asp  
165 170 175  
  
Gly Glu Met Pro Pro Tyr Leu Leu Ala Lys Asp Leu Ile Leu Gln Ile  
180 185 190  
  
Ile Gly Glu Ile Ser Val Ser Gly Ala Thr Tyr Lys Ser Met Glu Phe  
195 200 205  
  
Val Gly Ser Thr Val Glu Ser Leu Thr Met Glu Glu Arg Met Thr Leu  
210 215 220  
  
Cys Asn Met Val Ile Glu Ala Gly Gly Lys Asn Gly Val Val Pro Ala  
225 230 235 240  
  
Asp Glu Thr Thr Phe Lys Tyr Leu Glu Gly Lys Thr Ser Val Asp Tyr  
245 250 255  
  
Glu Pro Val Tyr Ser Asp Ala Gln Ala Arg Phe Phe Ser Asp Tyr Arg  
260 265 270  
  
Phe Asp Val Ser Lys Leu Glu Pro Val Val Ala Lys Pro His Ser Pro  
275 280 285

Asp Asn Arg Ala Pro Ala Arg Glu Cys Lys Asp Val Lys Ile Asp Arg  
290 295 300

Val Tyr Ile Gly Ser Cys Thr Gly Gly Lys Thr Glu Asp Phe Leu Ala  
305 310 315 320

Ala Ala Lys Val Phe Leu Ala Ser Gly Lys Lys Val Lys Val Pro Thr  
325 330 335

Phe Leu Val Pro Ala Thr Gln Lys Val Trp Leu Asp Ile Tyr Ser Leu  
340 345 350

Pro Val Pro Gly Ser Gly Gly Lys Thr Cys Ser Gln Ile Phe Glu Glu  
355 360 365

Ala Gly Cys Asp Thr Pro Ala Ser Pro Asn Cys Gly Ala Cys Leu Gly  
370 375 380

Gly Pro Arg Asp Thr Tyr Ala Arg Met Asn Glu Pro Thr Val Cys Val  
385 390 395 400

Ser Thr Thr Asn Arg Asn Phe Pro Gly Arg Met Gly His Lys Glu Gly  
405 410 415

Gln Ile Tyr Leu Ala Ser Pro Tyr Thr Ala Ala Ala Ser Ala Leu Thr  
420 425 430

Gly Tyr Val Thr Asp Pro Lys Asp Phe Leu Met  
435 440

<210> 39  
<211> 512  
<212> DNA  
<213> Oryza sativa

<220>  
<221> unsure  
<222> (303)...(303)

<220>  
<221> unsure  
<222> (331)

<220>  
<221> unsure  
<222> (400)

<220>  
<221> unsure  
<222> (467)

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<222> (486)

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<220>  
<221> unsure  
<222> (509)

<400> 39  
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 gaaaacactg atgctggttt tgtgatggc actggaaagg ctcttcttaa ggtgcctcca 180  
 actatcagt ttgttattaga tggagaaatg ccaccttatt tacttgcaaa ggatctgatt 240  
 ttacaatatta ttggtgagat ttctgtatct ggcgaacat acaaattccat ggagtttgtt 300  
 ggntcaactg tggaaagtct aaatatggaa nagcgaatga cactgtgcaa catggttatt 360  
 gaagctgggt gcaagaatgg tggtgtgcct gcccgcattcan actacattta actatcttga 420  
 gggcaagaca tcagttgaat acgagcctgt catagtgtatc ctcaagncaa atttgttagt 480  
 gactancgtt ttgangtata caaatttgngn ca 512

<210> 40  
 <211> 127  
 <212> PRT  
 <213> Oryza sativa

<220>  
 <221> UNSURE  
 <222> (109)

<400> 40  
 Val Cys His Val Ala Leu Ala Gln Glu Gly His Cys Arg Pro Gly Glu  
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Val Leu Leu Gly Thr Asp Ser His Thr Cys Asn Ala Gly Ala Phe Gly  
     20                 25                 30

Gln Phe Ala Thr Gly Ile Gly Asn Thr Asp Ala Gly Phe Val Met Gly  
     35                 40                 45

Thr Gly Lys Ala Leu Leu Lys Val Pro Pro Thr Ile Arg Phe Val Leu  
     50                 55                 60

Asp Gly Glu Met Pro Pro Tyr Leu Leu Ala Lys Asp Leu Ile Leu Gln  
     65                 70                 75                 80

Ile Ile Gly Glu Ile Ser Val Ser Gly Ala Thr Tyr Lys Ser Met Glu  
     85                 90                 95

Phe Val Gly Ser Thr Val Glu Ser Leu Asn Met Glu Xaa Arg Met Thr  
     100                 105                 110

Leu Cys Asn Met Val Ile Glu Ala Gly Gly Lys Asn Gly Val Val  
     115                 120                 125

<210> 41  
 <211> 823  
 <212> DNA  
 <213> Glycine max

<400> 41  
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 ctcgcagagt atagatttga tgtctaaaaa ttggagccag tggtgccaa gcctcattct 120  
 ccggataatc gtgcttggc aagagagtgc aaggatgtga aaatttgacag agtatacata 180  
 ggtatcttgc cagggtggcaa aacagaggat ttcatggctg cagcaaaagt ttttctggca 240  
 tcaggtaaac aggttcaaaatg ttcatttgc tttgtgcyytgc caacacaaaaa ggttttggatg 300  
 gacttgtact ccctccctgt ccctggatct ggtggtaaga catgctcaca gatatttgaa 360  
 gaagttgggt gtgacacacc agttagtccct agttgtggtg cttgtttggg tggcccaaaaa 420  
 gatacttacg cacgcatgaa tgaacctaag gtttgcgtt caactacgaa caggaacttc 480  
 ccggggccgaa tgggacacaa ggaaggtaa atctatttgg cttcccccatt tacagctgct 540  
 gcatctgcat tgaccggta tggtactgat cctagagatg tcttgcgtt gaaatgttgc 600  
 acaatcatct cattgtgttg tactcggtt tggttatttg tggatctct actctctact 660  
 agtcataatgtttaaaaactatattaa gcttaaccaa tcttttagta tttctaaatgtt 720  
 gatctttaga atcattcata tatgtgggtt aggtcaattc agatcaacat gaagttcaat 780  
 ttcaaattta gtagtgtttt gttttttaaa aaaaaaaaaaaa aaa 823

<210> 42  
<211> 195  
<212> PRT  
<213> Glycine max

<220>  
<221> UNSURE  
<222> (93)

<400> 42  
Leu Glu Gly Lys Thr Ser Leu Pro Tyr Glu Pro Val Tyr Ser Asp Asp  
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Gln Ala Arg Phe Leu Ala Glu Tyr Arg Phe Asp Val Ser Lys Leu Glu  
20 25 30  
  
Pro Val Val Ala Lys Pro His Ser Pro Asp Asn Arg Ala Leu Ala Arg  
35 40 45  
  
Glu Cys Lys Asp Val Lys Ile Asp Arg Val Tyr Ile Gly Ser Cys Thr  
50 55 60  
  
Gly Gly Lys Thr Glu Asp Phe Met Ala Ala Lys Val Phe Leu Ala  
65 70 75 80  
  
Ser Gly Lys Gln Val Lys Val Pro Thr Phe Leu Val Xaa Ala Thr Gln  
85 90 95  
  
Lys Val Trp Met Asp Leu Tyr Ser Leu Pro Val Pro Gly Ser Gly Gly  
100 105 110  
  
Lys Thr Cys Ser Gln Ile Phe Glu Glu Val Gly Cys Asp Thr Pro Ala  
115 120 125  
  
Ser Pro Ser Cys Gly Ala Cys Leu Gly Gly Pro Lys Asp Thr Tyr Ala  
130 135 140  
  
Arg Met Asn Glu Pro Lys Val Cys Val Ser Thr Thr Asn Arg Asn Phe  
145 150 155 160  
  
Pro Gly Arg Met Gly His Lys Glu Gly Gln Ile Tyr Leu Ala Ser Pro  
165 170 175  
  
Tyr Thr Ala Ala Ala Ser Ala Leu Thr Gly Tyr Val Thr Asp Pro Arg  
180 185 190  
  
Glu Phe Leu  
195

<210> 43  
<211> 530  
<212> DNA  
<213> Triticum aestivum

<400> 43  
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caggatctgg tggaaaaca tgctcccaga tatttgaaaa ggctgggtgt gatacaccag 180  
ctagtcctaa ttgtggcgct tgttgggtg gtcctcgta tacatatgca cggatgaatg 240  
aacctacggt ctgttatca acgacgaaca ggaacctccc gggcaggatg ggccacaagg 300  
aagggcagat ctacctggct tctcccttca ccgcggcggc ctcaagctttg acggatatg 360  
tcacggacc cagggacttc ctgtcgtaga gatcttgaaa acaatgaatt tgtgtgcgg 420  
accgtcctgt actggactt ttgttcgtg ttcaactg tagtttagat gcgtcatgtg 480  
tgtgtcggtc tgagaaataa gctactcaac gagtagcagt tgtaactgtt 530

<210> 44  
 <211> 126  
 <212> PRT  
 <213> Triticum aestivum

<400> 44  
 Phe Ile Ala Ala Ala Lys Val Phe Leu Ala Ser Gly Lys Lys Val Lys  
 1 5 10 15

Val Pro Thr Phe Leu Val Pro Ala Thr Gln Lys Val Trp Met Asp Val  
 20 25 30

Tyr Ser Leu Pro Val Pro Gly Ser Gly Gly Lys Thr Cys Ser Gln Ile  
 35 40 45

Phe Glu Glu Ala Gly Cys Asp Thr Pro Ala Ser Pro Asn Cys Gly Ala  
 50 55 60

Cys Leu Gly Gly Pro Arg Asp Thr Tyr Ala Arg Met Asn Glu Pro Thr  
 65 70 75 80

Val Cys Val Ser Thr Thr Asn Arg Asn Phe Pro Gly Arg Met Gly His  
 85 90 95

Lys Glu Gly Gln Ile Tyr Leu Ala Ser Pro Phe Thr Ala Ala Ser  
 100 105 110

Ala Leu Thr Gly Tyr Val Thr Asp Pro Arg Asp Phe Leu Ser  
 115 120 125

<210> 45  
 <211> 424  
 <212> PRT  
 <213> Methanococcus jannaschii

<400> 45  
 Met Gly Met Thr Ile Val Glu Lys Ile Leu Ala Lys Ala Ser Gly Lys  
 1 5 10 15

Lys Glu Val Ser Pro Gly Asp Ile Val Met Ala Asn Ile Asp Val Ala  
 20 25 30

Met Val His Asp Ile Thr Gly Pro Leu Thr Val Asn Thr Leu Lys Glu  
 35 40 45

Tyr Gly Ile Glu Lys Val Trp Asn Pro Glu Lys Ile Val Ile Leu Phe  
 50 55 60

Asp His Gln Val Pro Ala Asp Ser Ile Lys Ala Ala Glu Asn His Ile  
 65 70 75 80

Leu Met Arg Lys Phe Val Lys Glu Gln Gly Ile Lys Tyr Phe Tyr Asp  
 85 90 95

Ile Arg Glu Gly Val Cys His Gln Val Leu Pro Glu Lys Gly His Val  
 100 105 110

Ala Pro Gly Glu Val Val Val Gly Ala Asp Ser His Thr Cys Thr His  
 115 120 125

Gly Ala Phe Gly Ala Phe Ala Thr Gly Ile Gly Ser Thr Asp Met Ala  
 130 135 140

His Val Phe Ala Thr Gly Lys Leu Trp Phe Lys Val Pro Glu Thr Ile  
 145 150 155 160

Tyr Phe Asn Ile Thr Gly Asp Leu Gln Pro Tyr Val Thr Ser Lys Asp  
165 170 175

Val Ile Leu Ser Ile Ile Gly Glu Val Gly Val Asp Gly Ala Thr Tyr  
180 185 190

Lys Ala Cys Gln Phe Gly Gly Glu Thr Val Lys Lys Met Ser Ile Ala  
195 200 205

Ser Arg Met Thr Met Thr Asn Met Ala Ile Glu Met Gly Gly Lys Thr  
210 215 220

Gly Ile Ile Glu Pro Asp Glu Lys Thr Ile Gln Tyr Val Lys Glu Ala  
225 230 235 240

Met Lys Lys His Gly Thr Glu Arg Pro Phe Glu Val Ile Lys Gly Asp  
245 250 255

Glu Asp Ala Glu Phe Ala Glu Val Tyr Glu Ile Glu Ala Asp Lys Ile  
260 265 270

Glu Pro Val Phe Ala Cys Pro His Asn Val Asp Asn Val Lys Gln Ala  
275 280 285

Arg Glu Val Ala Gly Lys Pro Ile Asp Gln Val Phe Ile Gly Ser Cys  
290 295 300

Thr Asn Gly Arg Leu Glu Asp Leu Arg Met Ala Ile Lys Ile Ile Glu  
305 310 315 320

Lys His Gly Gly Ile Ala Asp Asp Val Arg Val Val Val Thr Pro Ala  
325 330 335

Ser Arg Glu Glu Tyr Leu Lys Ala Leu Lys Glu Gly Ile Ile Glu Lys  
340 345 350

Phe Leu Lys Tyr Gly Cys Val Val Thr Asn Pro Ser Cys Ser Ala Cys  
355 360 365

Met Gly Ser Leu Tyr Gly Val Leu Gly Pro Gly Glu Val Cys Val Ser  
370 375 380

Thr Ser Asn Arg Asn Phe Arg Gly Arg Gln Gly Ser Leu Glu Ala Glu  
385 390 395 400

Ile Tyr Leu Ala Ser Pro Ile Thr Ala Ala Ala Cys Ala Val Lys Gly  
405 410 415

Glu Leu Val Asp Pro Arg Asp Leu  
420

<210> 46

<211> 1033

<212> DNA

<213> Zea mays

<400> 46

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ctaaaaatgcc gccgcgctgg gtccatcgct cccgcggccq ctgctgccgc ggccggcagc 180  
agctcgccgt cgtcagccgt ttccacggc gagtgcttcg tggtgggcga caatatcgac 240  
accgaccaga tcatccccgc cgagcacctc actctggtgc cctccaagcc ggacgagttac 300  
cgcaagctcg gttcccttcgc cttcgcgggg ctcccatccg cggcttaccc gacggcgttc 360  
gtcgctccgg gtgaggagtc ctcccgctac gccatcattg tcggcggagc caacttcggg 420  
tgcgggttcct ctcgcgagca cgcgcggcgtc gcgctgggg ccgctggcgc acgcgcccatt 480  
gttgcgsgagg gctacgcgcg catttttt ccgaactccg tggccactgg agaggtgtac 540

cctctggagc	tcacggacgt	tggggcctgg	aaggagtgc	agacagggga	tgtggtcacc	600
gtggaccttgc	ctaactccgt	ttttatataac	cacacctctg	gcaaggagta	caagctgaaa	660
ccaattgtgt	atgtggccc	tgtatggag	gcggggaggga	tctttgccta	cgccccggaaag	720
acaggaatga	ttgcgtcgaa	agctgctgca	tgaggggaaag	cttatgcagc	cgagcctctg	780
cggagatgaa	gaagtaagct	ggagtttagga	ctaagaggtta	ctgcacccat	ttgatgtcga	840
cggtgtctca	aaataagttg	cggcctaccg	aaattatgtat	aatcaatca	atttgggtctt	900
tgtcacagat	cgtttttttt	tgtlactagt	acttgtacaa	ttgtactcct	gcctgctact	960
gttcttatct	gttgaataa	ctgctctgtt	gccaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	1020
aaaaaaaaaa	aaa					1033

<210> 47  
<211> 249  
<212> PRT  
<213> Zea mays

<400> 47						
Met Ala Ala Ala Leu Ser Gly Thr Ala Val Ser Thr Ala Ala Leu Leu						
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Ala Pro Ile Arg Ala Pro Thr Ser Ala Phe Ile Arg Arg Ser Gln Leu						
20	25	30				
Thr Cys His Arg Leu His Ser Leu Lys Cys Arg Arg Ala Gly Ser Ile						
35	40	45				
Val Pro Ala Ala Ala Ala Ala Gly Ser Ser Ser Pro Ser Ser						
50	55	60				
Ala Val Phe His Gly Glu Cys Phe Val Val Gly Asp Asn Ile Asp Thr						
65	70	75			80	
Asp Gln Ile Ile Pro Ala Glu His Leu Thr Leu Val Pro Ser Lys Pro						
85	90	95				
Asp Glu Tyr Arg Lys Leu Gly Ser Phe Ala Phe Ala Gly Leu Pro Ser						
100	105	110				
Ala Ala Tyr Pro Thr Pro Phe Val Ala Pro Gly Glu Ser Ser Arg						
115	120	125				
Tyr Ala Ile Ile Val Gly Gly Ala Asn Phe Gly Cys Gly Ser Ser Arg						
130	135	140				
Glu His Ala Pro Val Ala Leu Gly Ala Ala Gly Ala Arg Ala Ile Val						
145	150	155			160	
Ala Glu Gly Tyr Ala Arg Ile Phe Phe Arg Asn Ser Val Ala Thr Gly						
165	170	175				
Glu Val Tyr Pro Leu Glu Leu Thr Asp Val Gly Ala Trp Lys Glu Cys						
180	185	190				
Lys Thr Gly Asp Val Val Thr Val Asp Leu Ala Asn Ser Val Phe Ile						
195	200	205				
Asn His Thr Ser Gly Lys Glu Tyr Lys Leu Lys Pro Ile Gly Asp Ala						
210	215	220				
Gly Pro Val Ile Glu Ala Gly Gly Ile Phe Ala Tyr Ala Arg Lys Thr						
225	230	235			240	
Gly Met Ile Ala Ser Lys Ala Ala Ala						
245						
<210> 48						
<211> 1112						

<212> DNA  
<213> Oryza sativa

<400> 48

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acgttccgcc gcccgagctg ggtcgccgct atctgcccgc cggccctgaa atgcccaccac 180  
agtctgtcccc tgaccggccgt ggtcgccgctg gtcgcccgtc cggctgcggc gggggactcg 240  
acgtcgccgc gcgtattcca cggcgagtg tcgtcgctgg gggataacat cgacaccgac 300  
cagatcatcc cggccgagca cctgaccctg gtcccgtcca agcccgacga gtaccgcaag 360  
ctcggctcgta tcgccttcgt cggcctcccc accgcggcct acccgacgac gttcgtcgcc 420  
cccggcgagg agaccacccg ctacggcgtc atcatcgccg ggcacactt cgctgcggc 480  
tcctcccgcg agcacgcgcg cgtcgccctg ggcgcgcgcg ggcgcgcgc cgctcggtggc 540  
gagggtctcg cgcgcacattt cttccgcac tccgtggcca ccgggtgagggt ctaccgttg 600  
gagctagccg acactggagc ctggaaaggag tgcaagaccc gggatgtggt cacgggtggaa 660  
cttggataatt gcgtcatgt caaccacaca tccggcaagc agtacaagct gaagcctatc 720  
ggcgatgcgg ggccggttat tgaggcaggc gggatctttg cctatggccg gaagaccgga 780  
atgatcgcat ccaagtctgc gtgagggaaa ggcgagttt gtctgctgtc aagatagtcg 840  
aggcctctgc agatagcaag taagactggg ttgtggattt gaacctattt cacctctatg 900  
cgattgtcca tcagttgtac tgctgtttt acctaggttt tgtgtcatca gtgggtttt 960  
tggaaataagt taaaagttac agagtactga actatgtat attagttccat gtgatcttat 1020  
gtaacacccctt atgtaataca ctcgttata cctgcccattt tgccatatctc gtttcgataaa 1080  
aaaaaaaaaaaa aaaaaaaaaaa aaaaaaaaaaa aa 1112

<210> 49

<211> 257

<212> PRT

<213> Oryza sativa

<400> 49

Met Ala Ala Ala Ala Ala Pro Ala Leu Ser Leu Ala Glu Ala Ala  
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Pro Val Thr Ala Val Leu Ala Pro Cys Pro Thr Pro Ser Arg Thr Phe  
20 25 30

Arg Arg Arg Ser Trp Val Ala Ala Ile Cys Arg Pro Ala Leu Lys Cys  
35 40 45

His His Ser Arg Pro Leu Thr Ala Val Val Ala Ala Ala Ala Ala  
50 55 60

Ala Ala Ala Gly Asp Ser Thr Ser Ala Gly Val Phe His Gly Glu Cys  
65 70 75 80

Phe Val Val Gly Asp Asn Ile Asp Thr Asp Gln Ile Ile Pro Ala Glu  
85 90 95

His Leu Thr Leu Val Pro Ser Lys Pro Asp Glu Tyr Arg Lys Leu Gly  
100 105 110

Ser Phe Ala Phe Val Gly Leu Pro Thr Ala Ala Tyr Pro Thr Pro Phe  
115 120 125

Val Ala Pro Gly Glu Glu Thr Thr Arg Tyr Ala Val Ile Ile Gly Gly  
130 135 140

Ala Asn Phe Gly Cys Gly Ser Ser Arg Glu His Ala Pro Val Ala Leu  
145 150 155 160

Gly Ala Ala Gly Ala Arg Ala Val Val Ala Glu Gly Tyr Ala Arg Ile  
165 170 175

Phe Phe Arg Asn Ser Val Ala Thr Gly Glu Val Tyr Pro Leu Glu Leu  
180 185 190

Ala Asp Thr Gly Ala Trp Lys Glu Cys Lys Thr Gly Asp Val Val Thr  
195 200 205

Val Glu Leu Asp Asn Cys Val Met Ile Asn His Thr Ser Gly Lys Gln  
210 215 220

Tyr Lys Leu Lys Pro Ile Gly Asp Ala Gly Pro Val Ile Glu Ala Gly  
225 230 235 240

Gly Ile Phe Ala Tyr Ala Arg Lys Thr Gly Met Ile Ala Ser Lys Ser  
245 250 255

Ala

<210> 50  
<211> 1107  
<212> DNA  
<213> Glycine max

<400> 50  
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ccctctctca ctctcacact ctcttacccgc gcttccttc tttcccaact cccaaagtcat 180  
caaaccctcg caaccgcgtc gcagtcttc tccaaacccc acgcgctcaa tccgcccgt 240  
ccgcttctcc ctccgcctcc ttccacgcgc tctgctacgt cgtcggcgac aatatcgaca 300  
ccgaggat cattccgcgc gagtacctca ccctcgcccc ttccaagccc gacgagtacg 360  
agaagctcgg ctcctacgccc ctcatcgccc tccccggccac ctacgcacag cgtttcatcg 420  
aacccggcga gataaaaacc aagtacgcgc tcgtcatcg tggtgccaaac ttcgggttgcg 480  
gctccctcccg cgagcacgcgc cccgtcgccgc tgggcgcctc cggcgccgccc gcagtggtcg 540  
cggagtcgta cgctaggatc ttcttcggaa actccgtggc caccggcgag gtgtatccgc 600  
tagagtcgga gggacgcctc tgcgaggagt gcaccacccgg cgatgtggtg acgattgagc 660  
tcggagagag ccgcttgcata aatcacacca ccggaaaggaa gtatgccttgc aaaccgatcg 720  
gcgacgcggg tccagtgtac gaggccgggt qcattttgc ctatgccagg aaaacccggca 780  
tgattccctc tcgttgagtt cttaggtga gggcagtgaa ctctgctatc cttagcttgc 840  
atgacatgtctcataagaaa tgtattgacc caatggatgc cttagcttgc tccatttatca 900  
aataggctag aacttgcaga gatataatac atggcaatag aaagtgtgtt ttaatggttc 960  
ttgtatccac gaaatgggac caatttgcc ccatttatca atcagaatgg tacttatttt 1020  
tcctcgggca aaaaaaaaaaaaaaa aaaaaaag 1080  
1107

<210> 51  
<211> 263  
<212> PRT  
<213> Glycine max

<220>  
<221> UNSURE  
<222> (4)

<400> 51  
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Leu Ala Phe Thr Lys Leu Ser Leu Ser His Ser His Thr Leu Leu Pro  
35 40 45

Arg Phe Leu Ser Phe Pro Thr Pro Lys Ser Ser Asn Pro Arg Asn Arg  
50 55 60

Val Ala Val Ser Leu Gln Thr Pro Arg Ala Gln Ser Ala Ala Ser Ala  
65 70 75 80

Ser Pro Ser Ala Ser Phe His Gly Leu Cys Tyr Val Val Gly Asp Asn  
85 90 95

Ile Asp Thr Asp Gln Ile Ile Pro Ala Glu Tyr Leu Thr Leu Val Pro  
100 105 110

Ser Lys Pro Asp Glu Tyr Glu Lys Leu Gly Ser Tyr Ala Leu Ile Gly  
115 120 125

Leu Pro Ala Thr Tyr Ala Thr Arg Phe Ile Glu Pro Gly Glu Ile Lys  
130 135 140

Thr Lys Tyr Ala Ile Val Ile Gly Gly Ala Asn Phe Gly Cys Gly Ser  
145 150 155 160

Ser Arg Glu His Ala Pro Val Ala Leu Gly Ala Ser Gly Ala Ala Ala  
165 170 175

Val Val Ala Glu Ser Tyr Ala Arg Ile Phe Phe Arg Asn Ser Val Ala  
180 185 190

Thr Gly Glu Val Tyr Pro Leu Glu Ser Glu Gly Arg Leu Cys Glu Glu  
195 200 205

Cys Thr Thr Gly Asp Val Val Thr Ile Glu Leu Gly Glu Ser Arg Leu  
210 215 220

Ile Asn His Thr Thr Gly Lys Glu Tyr Arg Leu Lys Pro Ile Gly Asp  
225 230 235 240

Ala Gly Pro Val Ile Glu Ala Gly Gly Ile Phe Ala Tyr Ala Arg Lys  
245 250 255

Thr Gly Met Ile Pro Ser Arg  
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<210> 52

<211> 995

<212> DNA

<213> Triticum aestivum

<400> 52

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gggtccatcg tcccccgcc cgctgctgcc gcggcgggca gcagctcgcc gtcgtcagcc 180  
gttttccacg gcgagtgttt cgtgggtggc gacaatatcg acaccgacca gatcatcccc 240  
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cctgttaattt aggcgggagg gatcttgc taccggccgg agacagggat gattgcgtcg 720  
aaagctgtcg catgagggaa agatcagctt atgcagccga gcctctgcgg agatgaagaa 780  
gtaagctgga gttaggacta agagttactg cacctactt atgtcgacgg tgtctaaaa 840  
taagttgcgg cctaccggaa ttatgtgaa tcaatcaatt tggtgtttgt cacagatcgt 900  
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<210> 53

<211> 244

<212> PRT

<213> Triticum aestivum

<400> 53  
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 Pro Thr Ser Ala Phe Ile Arg Arg Ser Gln Leu Thr Cys His Arg Leu  
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 His Ser Leu Lys Cys Arg Arg Ala Gly Ser Ile Val Pro Ala Ala Ala  
 35 40 45  
 Ala Ala Ala Ala Gly Ser Ser Pro Ser Ser Ala Val Phe His Gly  
 50 55 60  
 Glu Cys Phe Val Val Gly Asp Asn Ile Asp Thr Asp Gln Ile Ile Pro  
 65 70 75 80  
 Ala Glu His Leu Thr Leu Val Pro Ser Lys Pro Asp Glu Tyr Arg Lys  
 85 90 95  
 Leu Gly Ser Phe Ala Phe Ala Gly Leu Pro Ser Ala Ala Tyr Pro Thr  
 100 105 110  
 Pro Phe Val Ala Pro Gly Glu Ser Ser Arg Tyr Ala Ile Ile Val  
 115 120 125  
 Gly Gly Ala Asn Phe Gly Cys Gly Ser Ser Arg Glu His Ala Pro Val  
 130 135 140  
 Ala Leu Gly Ala Ala Gly Ala Arg Ala Ile Val Ala Glu Gly Tyr Ala  
 145 150 155 160  
 Arg Ile Phe Phe Arg Asn Ser Val Gly Thr Gly Glu Val Tyr Pro Leu  
 165 170 175  
 Glu Leu Thr Asp Val Gly Ala Trp Lys Glu Cys Lys Thr Gly Asp Val  
 180 185 190  
 Val Thr Val Asp Leu Ala Asn Ser Val Phe Ile Asn His Thr Ser Gly  
 195 200 205  
 Lys Glu Tyr Lys Leu Lys Pro Ile Gly Asp Ala Gly Pro Val Ile Glu  
 210 215 220  
 Ala Gly Gly Ile Phe Ala Tyr Ala Arg Lys Thr Gly Met Ile Ala Ser  
 225 230 235 240  
 Lys Ala Ala Ala

<210> 54  
 <211> 113  
 <212> PRT  
 <213> Lactococcus lactis

<400> 54  
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 Asp Tyr Asp Asn Asp Asn Ala Lys Tyr Lys Lys Ala Ser Ser Gly Asp  
 35 40 45  
 Asn Gly Ser Gly Ser Ser Arg His Ala Ala Trp Ala Ser Asp Tyr Gly  
 50 55 60

Arg Ala Ala Gly Ser Tyr Ser Asp Tyr Asn Asn Ala Lys Asn Gly Lys  
65 70 75 80

Arg Val Asn Thr Lys Ser Ser Thr Asp His Thr Ser Gly Asp His Asp  
85 90 95

Trp Lys Asp Lys Asn Gly Asp Asp Gly Thr Tyr Ala Ser Ala Tyr Lys  
100 105 110

Asn